

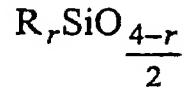
REMARKS

Reconsideration of the present application is requested in view of the foregoing amendments and the following remarks.

I. Claim Amendments

Prior to this amendment, claims 1, 3-19, 21-38, 41, 42, and 44-48 were pending.

Claims 1, 19, and 35 are amended to replace the phrase “silicon polymer” with the phrase “a crosslinkable organopolysiloxane.” Claims 49 and 50 are requested to be added. Claims 49 and 50 depend from claims 1 and 19, respectively, and recite “wherein the crosslinkable organopolysiloxane is composed of units of formula:



wherein

R may be identical or different and are unsubstituted or substituted hydrocarbon radicals, r is 0, 1, 2, or 3 and has an average numerical value of from 1.9 to 2.1.” Support for the claim amendments is provided in the original specification, for example at page 6, lines 17-27.

Claim 51 also is requested to be added and recites subject matter related to claim 1 and previously presented claims 44 and 45.

After the claim amendments are entered, claims 1, 3-19, 21-38, 41, 42, and 44-51 are pending. Claims 35-38 currently are withdrawn from consideration.

II. Claims Rejections – 35 U.S.C. § 102 and 103

The claims have been rejected under 35 U.S.C. §103 as being unpatentable over references that include Mizutani *et al.* (JP-55078073) [hereinafter “Mizutani”]. The claims have been amended

to further clarify and distinguish the claimed subject matter over the cited references. Reconsideration of the rejection is requested in view of the following remarks.

In the final Office Action, the Examiner stated:

Applicants arguments regarding the previously relied upon prior art reference of Mizutani et al. (JP-55078073) has been fully considered and it not found to be persuasive. Specifically, while Applicants have shown in an attached Declaration that the combination of mica and glass additive affords superior heat shrinkage when compared with compositions having mica and glass additive outside the range of the instant claims. While Applicants have shown an improved property when employing specific amounts of mica and glass additive in the attached Declaration, the experiments performed therein (and in the instant specification) are insufficient to overcome the prior art rejections involving Mizutani et al. For one thing, Applicants have not even defined what silicone polymer is employed in the Declaration and specification. Further, the attached Declaration employs peroxide in all examples; such ingredient is not present in any of the claims. Specifically the independent claims recite the limitation "a silicone polymer". It is unclear from the Declaration and Applicants specification which silicone polymer was employed. The limitation 'silicone polymer' is believed to be so overly generic that a showing of a single type of silicone polymer (which is not defined in Applicants working examples and Declaration) is not commensurate in scope with this limitation. Applicants are encouraged to more specifically define this limitation in the independent claims in order to overcome the prior art of record. More specifically, the limitation silicone polymer includes a multitude of polymer ranging from volatile liquids to gels to hard rubbers; both crosslinked and non-crosslinked systems, silicone resins, silicone-based surfactants, water-soluble silicone polymers, silicone polymers bearing liquid crystalline substituents, silicone copolymers having other repeat units present, i.e., siloxane-urethane copolymers, siloxane-urea copolymers, etc.

(See Office Action dated June 10, 2009, page 2-3). In the foregoing amendment and as discussed below, Applicants have attempted to address the Examiner's concerns.

Applicants first note that the claims have been amended to recite "crosslinkable organopolysiloxane" rather than "silicon polymer." New claims 49 and 50 further recite a formula for the units of the crosslinkable organopolysiloxane. This further clarifies the claimed subject matter and addresses the Examiner contention that Applicants' showing is not commensurate with the scope of the claims.

Regarding the nature of the invention and as stated in the Summary of the Invention, "[t]he applicant has found that the presence of low levels of glass additive in fire resistant composition comprising a silicone polymer and mica, markedly improves the mechanical strength of the ceramic being formed on heating the composition." (See specification at page 2, lines 31-33). As the Examiner will appreciate, when a silicon polymer is heated, it forms a ceramic comprising silicon dioxide (*i.e.*, SiO₂). This is true for a broad category of silicon polymers including the recited crosslinkable organopolysiloxane. Furthermore, Applicants have defined crosslinkable organopolysiloxanes that are suitable for the claimed composition in the specification at page 6, line 17, to page 8, line 25.

Also regarding the nature of the invention and as stated in the Summary of the Invention:

The applicants have found that compositions having glass additives greater than 8% by weight experience sustained volume shrinkage when subjected to temperatures greater than 1000°C. For fire protection applications, it is preferable that this shrinkage is less than 10% and more preferably less than 5%. Hence, the amount of glass added is adjusted to ensure that the composition or articles formed from the composition comply with the desired volume shrinkage limits for a given application at the fire rating temperature. As mentioned earlier, the standards for fire rating of cables vary depending on the country, but are generally based on heating the cables to temperatures such as 650°, 750°, 950°, 1050° in a prescribed manner for a specified time such as 15 minutes, 30 minutes, 60 minutes and 2 hours.

(See specification at page 5, lines 1-11). Accordingly, the claims have been amended to recite “wherein after the composition is heated to 1000°C and then held at 1000°C for 30 minutes in air the composition exhibits less than about 10% volume shrinkage.” This phrase further limits the scope of the recited crosslinkable organopolysiloxane, where the composition comprising from 56.5% to 76.75% of the crosslinkable organopolysiloxane must exhibit less than about 10% volume shrinkage after the composition is heated to 1000°C and then held at 1000°C for 30 minutes in air.

Applicants have prepared and determined percent shrinkage for several silicon polymer compositions. In the specification at Example 1, Table 1, and as discussed in the Declaration, Applicants determined the percent shrinkage for a thermally crosslinked silicone polymer composition that contained various amounts of silicone elastomer, peroxide, mica and glass frit. Also, in the specification at Example 4, Table 6, Applicants determined the percent shrinkage for a thermally crosslinked silicone polymer composition that contained various amounts of silicone elastomer, peroxide, mica and glass fibre or frit. As is appreciated in the art, the term “silicone elastomer” is interchangeable with the term “silicon rubber” which is a polymer that has silicon-oxygen linkages (*i.e.*, an organopolysiloxane as recited in the claims). The silicon elastomer utilized in Examples 1 and 4 was commercially available. (See specification at page 13, lines 19-20.)

Regarding the presence of hydrogen peroxide in the compositions of Example 1 and 4, Applicants note that hydrogen peroxide will rapidly degrade to water and oxygen when the compositions are heated to a temperature at which a ceramic forms. Also, Applicants have determined the percent shrinkage for compositions that do not include hydrogen peroxide. In the specification at Example 10, Table 9, Applicants determined the percent shrinkage for chemically crosslinked silicon foam compositions I and II that contained various amounts of silicone, mica, glass frit, magnesium hydroxide and optionally zinc borate. Compositions I and II do not include hydrogen peroxide. As stated in the specification, “[a]t 1050°C the volume changes for composition I and composition II were -6% and -1%, respectively, indicating that replacement of low-melt glass with zinc borate produces less volume change.” (See specification, page 25, lines 16-18).

The recited range of glass additive in the claims (*i.e.*, in an amount of from 0.3% to 8% by weight based on the total weight of the composition) is critical to minimize shrinkage while at the

same time maximizing mechanical strength of the composition after heating. (*See* specification at page 14, Table 1, regarding percent shrinkage at various concentrations of glass additive, and see specification at page 15, Table 2 and page 16, Table 3, regarding mechanical strength at various concentrations of glass additive). Because Applicants have shown that the recited range of 0.3 to 8% glass additive is critical to minimize shrinkage while at the same time maximizing mechanical strength of the composition after heating, Applicants have rebutted any *prima facie* case of obviousness. As stated in the Manual of Patent Examination Procedure (MPEP):

III. REBUTTAL OF *PRIMA FACIE* CASE OF OBVIOUSNESS

Applicants can rebut a *prima facie* case of obviousness based on overlapping ranges by showing the criticality of the claimed range. “The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. . . . In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range.” *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). See MPEP § 716.02 - § 716.02(g) for a discussion of criticality and unexpected results.

(*See* MPEP at page 2100-152). Applicants note that the recited range of 0.3 to 8% glass additive is not even disclosed in Mizutani nor does Mizutani disclose an overlapping range. Even so, Applicants have shown that the recited range of 0.3 to 8% glass additive is critical to minimize shrinkage while at the same time maximizing mechanical strength of the composition after heating. This determination required more than mere optimization and would have required undue experimentation by one skilled in the art.

For these reasons, reconsideration and withdrawal of the rejection are requested.

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Amendment Dated September 2, 2009
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III. Conclusion

It is believed that this application is in condition for allowance and such action is earnestly solicited.

Respectfully submitted,

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